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Liverpool, vacant by the appointment of Dr. Rendall to the headmastership of Charterhouse, has been filled by the election of Mr. Richard Tetley Glazebrook, M.A., F.R.S., Fellow and Senior Bursar of Trinity College, Cambridge. Mr. Glazebrook, who is a son of Dr. Glazebrook, of West Derby, was educated at Dulwich College and afterwards at Liverpool College, whence he obtained a scholarship at Trinity College, Cambridge. In 1876 he was fourth wrangler and in 1877 was elected a Fellow of his College. As an investigator he is best known for his researches in the higher branches of optics, and his chief papers have been on double refraction in biaxial crystals and on a dynamical theory of double refraction, both of which won high commendation from such authorities as Lord Kelvin and Sir Gabriel Stokes. He is also the recognized custodian of the British Association electrical units, now the standard for the world and is Secretary of the Electrical Standards Committee of the British Association.

MR. H. W. M. TIMS has been appointed professor of zoology in Bedford College, England.

AT Gonville and Caius College, Cambridge, the vacant Shuttleworth scholarships, each of the annual value of about £55, awarded for proficiency in botany and comparative anatomy, have been adjudged to Reginald Crundall Punnett for three years and to Harold William Atkinson, B.A., for two years.

SCIENTIFIC LITERATURE.

Living Plants and their Properties. A Collection of Essays. By JOSEPH CHARLES ARTHUR, Sc. D., Professor of Vegetable Physiology and Pathology in Purdue University, and DANIEL TREMBLY MACDOUGAL, Ph.D., Assistant Professor of Botany in charge of Plant Physiology in the University of Minnesota. New York, Baker & Taylor; Minneapolis, Morris & Wilson. 1898. Small 8vo. Pp. ix+234.

In recent years American botanists have generally been so burdened with the labor of botanical acquisition in systematic, structural or physiological fields that to a great degree their writings have been plain, matter-of-fact statements, interesting enough to other bota-

nists, but quite unattractive to those not trained in the somewhat severe school of modern botany. This condition has invited and encouraged many mere 'writers'—pleasant word-mongers, with nothing more than the thinnest superficial knowledge of plants—to issue books to meet the demand made by reading people for information regarding the life of plants. It has often been my very unpleasant duty to point out the dreadful blunders which are certain to result from attempts at bookmaking by those whose pens run more easily and rapidly than their botanical attainments justify, and yet in nearly every case it has been found that the book with all its blunders sold well, which indicates that many people read it. There is a demand for *readable* books about plants.

When it was announced, a little while ago, that two of our most active plant physiologists were bringing out a book on living plants and their properties it was supposed that, as a matter of course, it would be a modern text book, for use in the physiological laboratories now happily increasing in numbers in our universities. What was our surprise, then, to find that the authors have given us a readable book on topics like these: 'the special senses of plants;' 'the development of irritability;' 'Mimosa, a typical sensitive plant;' 'universality of consciousness and pain;' 'how cold affects plants;' 'leaves in spring, summer and autumn;' 'the significance of color;' 'the right to live;' 'distinction between plants and animals.' In the first chapter, after a general discussion regarding the nature of the senses, Dr. Arthur takes up in order the senses which plants possess, *i. e.*, 'the sense of contact,' the 'gravity sense,' sensitiveness to light, 'chemical sense' and 'moisture sense.' A single quotation from this interesting chapter will suffice to show the treatment (p. 14): "But what other senses have plants? I shall not attempt to show the numerous and interesting ways in which plants respond to light. Everyone knows how plants lighted from one side, as when placed before a window, bend toward the light. This is a true sensitiveness, for it results in bringing about definite movement. The stems place themselves parallel to the incident rays—that is, point toward the window; while the leaves

place themselves at right angles to the direction of the light—that is, with their upper surfaces to the window. Leaves and stems, therefore, show sensitiveness characteristic of each. Some stems, however, like those of Virginia creeper, turn away from light, enabling them to cling to dark walls. Roots, which are generally buried in the soil, rarely exhibit sensitiveness to light, and when they do it is usually to turn from it. If light comes to the organ from two directions it will bend toward the source of the stronger light, and differences which will affect the plant are far more minute than can be detected by the eye.”

In a similar way Dr. MacDougal discusses ‘how cold affects plants’ (Chapter VI). After speaking of the general appearance of a frozen leaf, he says (p. 88): “If now a section is made of a frozen leaf it will be found that the spaces between the cells usually containing air are filled almost solidly with ice crystals. From whence is this ice derived?” * * * “Protoplasm even in its simplest forms is highly automatic and self-regulating. When the cells of a leaf are subjected to a low temperature they contract, and a portion of the water is driven out into the intercellular spaces, where it is frozen. By this provision the proportion of water in the cells is reduced and the danger of ice formation and consequent destruction is averted. If now the temperature is again lowered, an additional amount of water is forced into the intercellular spaces, rendering the cell-solutions still more concentrated, and less easily crystallized into ice.” * * “It is thus to be seen that the extrusion of water into the intercellular spaces is a protective device of the protoplasm.”

It is unnecessary to quote more from these suggestive chapters. These examples will sharpen the interest of every reader of this notice, who may be assured that this interest will not flag as he reads the pages for himself. The book will make an admirable addition to the scientific alcove of every public library.

CHARLES E. BESSEY.

THE UNIVERSITY OF NEBRASKA.

Revision of the Orthopteran group Melanopli (Acrididæ), with special reference to North American forms. By SAMUEL HUBBARD

SCUDDER. Proc. U. S. National Museum, Vol. 20, pp. 1-421, Plates 1-26. 1897.

This work by Mr. Scudder deals with a group of acridians of which the Rocky Mountain locust and the common red-legged locust are familiar forms. The Melanopli are essentially North American, and on account of the number of the species and the variety of the forms present great difficulties to the student.

A short introduction gives the characters and limitations of the group, and its geographical distribution; also an interesting note concerning the dimorphism in the length of the tegmina, and a statement as to the sources of the material used in the work, acknowledgments of aid received, and a few words as to certain details of presentation.

An elaborate analytical key to the genera is given, and there are also keys to the species of all genera not monotypic. These keys are successful in epitomizing a large amount of close study, and, with the aid of the figures, afford a ready means for the determination of the species; in all cases, however, the descriptions must be consulted for confirmatory data.

The key to the species of *Melanoplus* (pp. 124-139) is so long as to suggest that a separate tabulation of the groups, designated as series, and of the species under each group, would have been more useful.

The generic and specific descriptions are given with the detail characteristic of Mr. Scudder's work. Thirty genera are recognized and of these eighteen are described as new, of North American species 208 (113 new) are described. An analytical key to the Old World species of *Podisma* with brief notes, including descriptions of two new species, is also given.

The material upon which these genera and species are based has in most cases been ample, more than 8,500 specimens having been studied; of the 208 species but two are unknown to Mr. Scudder; 31 species are known from one sex only and 21 species from uniques. The females outnumber the males, 4,596 to 3,911, or, stated differently, in 96 species the females are the most abundant, in 75 species the males; in 37 species the numbers are the same. The bibliography and geographical distribution are given in admirable detail.